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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,549	01/09/2002	Christopher A. Michaluk	00029CIP	5470

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1742

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/042,549	MICHALUK, CHRISTOPHER A.
	Examiner Andrew L Oltmans	Art Unit 1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.  
 2a) This action is FINAL.                  2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-94 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-94 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.  
 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.  
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.  
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____   |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3.5</u> . | 6) <input type="checkbox"/> Other: ____                                     |

**DETAILED ACTION**

***Claim Objections***

1. Claims 19, 24, 29, 54, 64, 73, 76, 79, 82, 85 and 88 are objected to because of the following informalities:
  - a. Claims 19, 24, 29, 54 and 64 claim temperatures in Fahrenheit, wherein claims 73, 76, 79, 82, 85 and 88 claim temperatures in Celsius. In the interest of clarity and to prevent confusion, the Examiner suggests that the applicant utilize a single system of temperature and amend the claims to reflect that single system.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

*Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 and Friedman, "Grain Size Refinement in a Tantalum Ingot, Metallurgical Transactions, Vol. 2, January 1971, pages 337-341, XP02227180 (Friedman)*

3. Claims 1-6, 8-11, 13, 71-73 and 89-90 are rejected under 35 U.S.C. 102(b) as being anticipated by each of Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August

1992, pages 2183-2191 (Clark) and Friedman, "Grain Size Refinement in a Tantalum Ingot, Metallurgical Transactions, Vol. 2, January 1971, pages 337-341, XP02227180 (Friedman; cited on IDS filed February 27, 2003).

Clark teaches an extruded tantalum billet having a substantially uniform grain size (note definition of substantially uniform grain size in the specification paragraph bridging pages 5-6) which is fully recrystallized via annealing, as recited in claims 1-2, 8-11, 13, 71-73 and 89-90 (page 2184, Figure 2; page 2186, Table I; page 2190, Section C and Conclusions paragraph 1). Clark et al. teaches extruded articles having the grain size instantly claimed in instant claims 3-6 (page 2186, Table I). The claims do not distinguish over the teachings of Clark.

Friedman teaches an extruded tantalum billet having a substantially uniform grain size (note definition of substantially uniform grain size in the specification paragraph bridging pages 5-6) which is fully recrystallized via annealing, as recited in claims 1-2, 8-11, 13 and 89-90 (page 337, column 1, first paragraph; page 339, Figure 2; page 340, Table IV; page 340 2<sup>nd</sup> full paragraph to end of article on page 341). Friedman teaches extruded articles having the grain size instantly claimed in instant claims 3-6 (page 340, Table IV). The claims do not distinguish over the teachings of Friedman.

***Japanese Patent JP 2000104164 A***

4. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent JP 2000104164 A (JP '164).

NOTE: References to JP '164, below, are either to the English language abstract, or to the full English language translation provided.

JP '164 teaches that the niobium sputtering target is preferably made of a high grade (i.e. high purity) Nb having a substantially uniform grain size (note definition of substantially uniform grain size in the specification paragraph bridging pages 5-6) of less than 100  $\mu\text{m}$  and preferably 50  $\mu\text{m}$  (paragraphs [0034] and [0045]). The claims do not distinguish over the teachings of JP '164.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

*Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 in view of Friedman et al. 5,482,672*

6. Claims 18-35, 74-79 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 (Clark) in view of Friedman et al. 5,482,672 (Friedman).

Clark teaches and is applied as set forth above in paragraph 3.

Clark fails to meet all the limitations of the instant claims in that Clark does not explicitly teach the particular extrusion conditions.

Friedman teaches the extrusion of tantalum and niobium ingots (col 19-20 and 41-44), including the temperature of extrusion (col 4, lines 58-60), the coating of the material (col 5, lines 13-16), the removal of the coating (col 5, lines 17-21), as recited in instant claims 18-35, 74-79 and 91. Friedman teaches that the extrusion process is advantageous because it provides a way to make bars, rods and tubes out of “difficult to make” metals (i.e. tantalum and niobium) (col 1, lines 10-14).

One of ordinary skill in the art would have found the invention to be obvious because one of ordinary skill in the art would have been motivated to use the particular processing conditions of Friedman because extrusion of tantalum and niobium is known in the art, as shown in Friedman; therefore, the particular processing conditions taught therein would be obvious as the particular conditions used in Clark, wherein one of ordinary skill in the art would find it desirable to provide an extrusion process that allows for the formation of bars, rods and tubes of tantalum or niobium, as taught in Friedman.

With respect to the limitation of recrystallization during extrusion (claims 18 and 23), one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the process steps taught by the reference are the same as the process steps recited in the claims (i.e. extrusion at the same processing temperature (Friedman: col 4, lines 58-60)) and therefore one of ordinary skill in the art would expect that the products resulting from the process taught by the reference would be the same as the product resulting from applicant’s claimed process, including the product’s degree of recrystallization.

**“Where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best 195 USPQ 430, 433 (CCPA 1977). ‘When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.’ In re Spada, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore,**

the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01. [emphasis added by examiner]

*Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 in view of International Application Publication WO 87/07650 (WO '650)*

7. Claims 7, 12, 14 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 (Clark) in view of International Application Publication WO 87/07650 (WO '650).

Clark teaches and is applied as set forth above in paragraph 3.

Clark fails to meet all the limitations of the instant claims in that Clark does not explicitly teach the purity claimed, the metal in the article, the sputtering target, or resistive film layer.

WO '650 teaches the purity claimed in instant claims 7 and 12 and the metal in a sputtering target (i.e. an article), and a resistive film layer (abstract), as recited in claims 14 and 16-17. WO '650 teaches that the use of highly pure tantalum in the formation of the target results in a high-quality oxide insulating film and metallic Ta electrode film (abstract).

One of ordinary skill in the art at the time that the invention was made would have been motivated to use the high purity tantalum material of WO '650 in the process of Clark in order to provide Clark with the desirable result of providing a material when formed into a tantalum sputtering target, as taught in WO '650, the material yields a high quality oxide insulating film and metallic Ta electrode film (WO '650: abstract).

*Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 in view of Rerat 4,149,876*

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum", Metallurgical Transactions A, Volume 23A, August 1992, pages 2183-2191 (Clark) in view of Rerat 4,149,876 (Rerat).

Clark teaches and is applied as set forth above in paragraph 3.

Clark fails to meet all the limitations of the instant claims in that Clark does not explicitly teach the capacitor can.

Rerat teaches that tantalum and niobium are desirable materials for forming capacitor components, including the capacitor can (col 1, lines 6-7; col 2, line 48 to col 3, line 35; col 16, claim 1).

One of ordinary skill in the art at the time that the invention was made would have been motivated to use the material of Clark to form capacitor parts because the formation of capacitor parts from tantalum and niobium is well-known, as shown in Rerat, wherein tantalum and niobium provide desirable electrical properties to the capacitors (col 2, line 48 to col 3, line 35).

*Japanese Patent Document JP 2000104164 A in view of Friedman 5,482,672*

9. Claims 37-41, 43-46, 48-49, 51-70, 80-88, 92-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Document JP 2000104164 A (JP '164) in view of Friedman 5,482,672 (Friedman).

NOTE: References to JP '164, below, are either to the English language abstract, or to the full English language translation provided.

JP '164 teaches a niobium sputtering target and a niobium resistive film resulting from the use of the sputtering target used in connection with a semiconductor device (i.e. an article comprising niobium) (abstract, paragraph [0007] and [0008]), as recited in instant claims 37, 48-49, and 51-52. JP '164 teaches that the niobium sputtering target is preferably made of a high grade (i.e. high purity) Nb having a substantially uniform grain size (note definition of substantially uniform grain size in the specification paragraph bridging pages 5-6) of less than 100  $\mu\text{m}$  and preferably 50  $\mu\text{m}$  (paragraphs [0034] and [0045]), as recited in instant claims 37-41. JP '164 further teaches the method of making the niobium sputtering target as including the steps of providing an purified niobium material (paragraph [0049]), forging (i.e. flat forging) (paragraph [0050]), plastic working the material 50-98% (paragraph [0050]), and recrystallization annealing at temperature of 800-1300 $^{\circ}\text{C}$  for at least 1 hour to produce the recrystallized niobium have the fine crystal size (paragraph [0051]), as recited in instant claims 43-46, 80-88 and 92-94. JP '164 teaches that the niobium sputtering target is fully recrystallized (paragraphs [0051] and [0062]), as recited in instant claims 43-46.

JP '164 fails to meet all the limitations of the instant claims in that JP '164 does not explicitly teach extrusion.

Friedman teaches the extrusion of tantalum and niobium ingots (col 19-20 and 41-44), including the temperature of extrusion (col 4, lines 58-60), the coating of the material (col 5, lines 13-16), the removal of the coating (col 5, lines 17-21), as recited in instant claims 37 and 53-70. Friedman teaches that the extrusion process is advantageous because it provides a way to

make bars, rods and tubes out of “difficult to make” metals (i.e. tantalum and niobium) (col 1, lines 10-14).

One of ordinary skill in the art would have found the invention to be obvious because one of ordinary skill in the art would have been motivated to use the process of Friedman because extrusion of tantalum and niobium is known in the art, as shown in Friedman; therefore, the particular processing conditions taught therein would be obvious as the particular conditions used in JP ‘164, wherein one of ordinary skill in the art would find it desirable to provide an extrusion process that allows for the formation of bars, rods and tubes of tantalum or niobium, as taught in Friedman.

With respect to the limitation of recrystallization during extrusion (claims 53 and 58), one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the process steps taught by the reference are the same as the process steps recited in the claims (i.e. extrusion at the same processing temperature (Friedman: col 4, lines 58-60)) and therefore one of ordinary skill in the art would expect that the products resulting from the process taught by the reference would be the same as the product resulting from applicant’s claimed process, including the product’s degree of recrystallization.

“Where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best 195 USPQ 430, 433 (CCPA 1977).

‘When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.’ In re Spada, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best 195 USPQ 430, 433 (CCPA 1977).” see MPEP 2112.01. [emphasis added by examiner]

*Japanese Patent Document JP 2000104164 A in view of Friedman 5,482,672 in further view of Japanese Patent JP 362104180A*

10. Claims 42 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Document JP 2000104164 A (JP '164) in view of Friedman 5,482,672 (Friedman) in further view of Japanese Patent JP 362104180A (JP '180).

JP '164 and Friedman are taught as are applied as set forth in paragraph 9, above.

JP '164 and Friedman fail to meet all the limitations of the instant claims in that JP '164 and Friedman do not explicitly teach the purity of the coating

JP '180 teaches a super high-purity niobium sputtering target, which has a purity of greater than 99.99% wherein the level of purity provided results in the desirable effect of reducing non-uniformity of the film resulting from the target's use in a sputtering process (abstract, Japanese Document, page 410, column 1, table 1 and preceding paragraph), as recited in instant claims 42 and 47.

With respect to the purity claimed in instant claims 42 and 47, one of ordinary skill in the art at the time that the invention was made would have found the invention to be obvious because one of ordinary skill in the art would have been motivated to use the high purity niobium of JP '180 in the method and composition of JP '164 in order to provide JP '164 with the desirable properties taught in JP '180, including the reduction in non-uniformity of the sputtered film (JP '180: abstract).

One of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the niobium material taught by the reference has a composition which overlaps that of the instant claims, In re Peterson, 65 USPQ2d 1379, In re Malagari, 182 USPQ 549, and MPEP 2144.05.

***Japanese Patent Document JP 2000104164 A in view of Friedman 5,482,672 in further view of Rerat 4,149,876***

11. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Document JP 2000104164 A (JP '164) in view of Friedman 5,482,672 (Friedman) in further view of Rerat 4,149,876 (Rerat).

12. NOTE: References to JP '164 and JP '180, below, are either to the English language abstract, or to the full English language translations provided.

JP '164 and Friedman are taught as are applied as set forth in paragraph 9, above. JP '164 and Friedman fail to meet all the limitations of the instant claims in that JP '164 and Friedman do not explicitly teach the capacitor can.

Rerat teaches that tantalum and niobium are desirable materials for forming capacitor components, including the capacitor can (col 1, lines 6-7; col 2, line 48 to col 3, line 35; col 16, claim 1).

One of ordinary skill in the art at the time that the invention was made would have been motivated to use the material of JP '164 to form capacitor parts because the formation of capacitor parts from tantalum and niobium is well-known, as shown in Rerat, wherein tantalum and niobium provide desirable electrical properties to the capacitors (col 2, line 48 to col 3, line 35).

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Oltmans whose telephone number is 703-308-2594. The examiner can normally be reached 8:30-5:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-873-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Andrew L. Oltmans  
Examiner  
Art Unit 1742

April 23, 2003